

should highlight potential bias. Design thinking has much to offer the user-centered design process.

According to IDEO, “Design thinking relies on the human ability to be intuitive, to recognize patterns, and to construct ideas that are emotionally meaningful as well as functional. The elements of design thinking combine to form an iterative approach – one you can try out and adapt to suit your needs.”⁹

A good moderator approaches each study with a clean slate. During fieldwork and analysis, she is constantly “choosing a model and developing a narrative that both self and others can accept via trial and error.”¹⁰ This demands listening to participants and stakeholders to refine the model or narrative, and to effectively and engagingly answer the question at hand. It also demands an open mind to keep from following a dead end or biasing the output based on a single data point that matches a previously held expectation. The researcher zooms in and out to examine the leaves and the trees and the forest and back again, looking for trends and bigger picture ideas. She analyzes and synthesizes data and recommends ways forward. She strives to remain objective. Throughout these steps, the design thinking framework helps us take a step back and remain open minded, consider alternative points of view, recognize adjacent possibilities and, as is often the goal of this framework, to innovate.

Questioning our references and our points of view, examining for bias, forming compressions rather than representations as appropriate helps us see the big picture and makes good research and design. But as I read Lissack’s article, I wondered what the incentive was to put forth effort to do all of this, for instance when we read an article online or watch the news – especially when mental bandwidth and time seem to be in short supply. However, as the case of Cambridge Analytica illustrates, not engaging in this type of critical thinking is dangerous.

If we actively seek out alternative sources, and perhaps even conflicting points of view, to include in our models of the world, perhaps the algorithms of the future will be less biased, less open to manipulation – again, the machine itself is not choosing to manipulate, the singularity is not yet here. AI needs some human intervention. Humans have the unique ability to engage in reflexive self-aware cognizing. We need to use it.

¹ Frank Bruni, “The Real Horror of the Anti-Vaxxers,” *New York Times*, March 9, 2019, <https://www.nytimes.com/2019/03/09/opinion/sunday/the-real-horror-of-the-anti-vaxxers.html>.

- 2 Michael Lissack, “Understanding Is a Design Problem: Cognizing from a Designerly Thinking Perspective. Part 1,” *She Ji: The Journal of Design, Economics, and Innovation* 5, no. 3 (2019): 231–46, DOI: <https://doi.org/10.1016/j.sheji.2019.07.002>; Michael Lissack, “Understanding Is a Design Problem: Cognizing from a Designerly Thinking Perspective. Part 2,” *She Ji: The Journal of Design, Economics, and Innovation* 5, no. 4 (2019): 327–42, DOI: <https://doi.org/10.1016/j.sheji.2019.11.019>.
- 3 Alex Hern, “Cambridge Analytica: How Did It Turn Clicks into Votes?,” *The Guardian*, May 6, 2018, <https://www.theguardian.com/news/2018/may/06/cambridge-analytica-how-turn-clicks-into-votes-christopher-wylie>.
- 4 Lissack, “Understanding Is a Design Problem. Part 2,” 331.
- 5 Wikipedia, s.v., “Blind Men and an Elephant,” accessed November 10, 2019, https://en.m.wikipedia.org/wiki/Blind_men_and_an_elephant; see also John Godfrey Saxe, “The Blind Men and the Elephant,” in *The Poetical Works of John Godfrey Saxe* (1868; Boston: Houghton, Mifflin and Company, 1882), 111–12; *The Udāna: The Solemn Utterances of the Buddha*, trans. D. M. Strong (London: Luzac and Company, 1902), 93–96; *The Enclosed Garden of the Truth of the Hakim Abu’l-Majd Majdud Sana’i of Ghazna*, trans. ed. J. Stephenson (Calcutta: Baptist Mission Press, 1910), 13; Ramakrishna, *Sri Ramakrishna’s Teachings*, vol. 1 (Lohaghat P. O., Dt. Almora, Himalayas: Advaita Ashrama, 1916), 127.
- 6 Hern, “Cambridge Analytica.”
- 7 SearchEnterpriseAI, s.v. “machine learning bias (algorithm bias or AI bias),” accessed November 10, 2019, <https://searchenterpriseai.techtarget.com/definition/machine-learning-bias-algorithm-bias-or-AI-bias>, italics mine.
- 8 George Orwell, *1984* (London: Seeker & Warburg, 1949), 46.
- 9 “Design Thinking,” IDEO, accessed November 10, 2019, <https://www.ideo.com/pages/design-thinking>.
- 10 Lissack, “Understanding Is a Design Problem. Part 2,” 336.

Design: Necessity or Desire

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Abstract This essay presents a commentary on Michael Lissack’s article “Understanding Is a Design Problem: Cognizing from a Designerly Thinking Perspective.” I contextualize key terms and ideas, and raise several questions concerning the relation between the concept of compression and design.

Keywords Cognition; design; representation; Second-order Cybernetics

“Your life has a limit but knowledge has none. If you use what is limited to pursue what has no limit you will be in danger.”¹

Commonly, people encounter the world as something that happens around them, independently from them. Michael Lissack’s article “Understanding Is a Design Problem: Cognizing from a Designerly Thinking Perspective”² opens an alternative view onto the world. According to this view, the world is not a reality that exists independently from us who live in it. It does not merely happen to us. How we understand the world is the basis for all the possibilities for action. In this sense, our way of thinking constructs the world. Lissack’s article emphasizes the importance of understanding that cognizing is a form of designing. Such understanding facilitates a critical creative approach to the analysis of the situations that we encounter in our everyday life, offering through its approach new opportunities for action.

The article provides an introduction to some of the key thoughts associated with second-order cybernetics and its sister discipline radical constructivism. Lissack follows in the footsteps of other authors when he states that, under the condition of limited understanding, cognizing is a form of designing. The article could have profited from a more extended background section referencing some of the early contributions in this area. Heinz von Foerster’s 1973 article *On Constructing a Reality*³ is foundational in this context, and so is Stafford Beer’s series of radio transmissions published in 1974 under the title *Designing Freedom*.⁴ Lissack’s article follows up on Beer’s statement that we “must equip ourselves to revise “the “dysfunctional model” that we hold of the world.”⁵

The article differentiates between representations and compressions. It presents arguments that are in line with the standard literature in design research when it emphasizes that a model that relies on static representation is not an adequate model within the context of a design process.⁶ The question arises, however, as to whether the term compression – which is not typically used in design research – contributes to a better understanding of the models that are employed in design processes. I have a series of questions related to this.

I can see some value in redefining representation to include only what is static and fixed, introducing at the same time a new term for a dynamic model. It offers an opportunity to distance oneself from the representationalism that has been the dominant theory in the cognitive sciences,⁷ emphasizing instead a non-representational model. There are, however,

other definitions of representation that include dynamic processes. Benny Shanon, for example, provides evidence of such understandings.⁸

The article could benefit from better contextualizing both the term representation and the term compression. How does the concept of compression, as defined in the article, relate to metaphor, for example? In relation to non-representational theories of cognition, Shanon uses the term presentation. The cognitive scientist Mark Turner speaks of a concept entitled compression, but it is a form of static representation and thus the meaning differs from the one in the presented article.⁹ Amanda Zellmer and her colleagues¹⁰ use the term compression as well, but the definition is different again. They use the term narrative to explain a model that appears in large parts congruent with the model described by Lissack as compression. However, in their case, a narrative is the representation of a compression. They write: “If modelling is representation and analogy is compression, then a narrative is ... the representation of a compression, which is integrated at a higher level of analysis.”¹¹ I am wondering why one would choose the term compression over presentation or narrative.

To which extent does the concept of compression, as defined in the article, adequately describe the kinds of models that are commonly employed in processes of designing? Such models could be physical or digital working models, but also sketches. Table 1 of the article suggests that representations predict while compressions explore.¹² However, the models employed in design processes typically go beyond the exploration that is mentioned in Table 1. They are projective, not merely assisting interpretation. Design plays with sensations. It creates novel situations. Unlike science, design does not aim at addressing the future through prediction.¹³ I feel that there are some indications that the concept of design has been reduced to interpretation. Interpreting situations creatively and critically is an integral part of designing, but designing goes beyond interpretation. Design sets things, agents, and concepts into a conversation. It does so even with conflicting meanings. Design proceeds from wicked situations, and it does not tame them.¹⁴

Figure 1 in part 2¹⁵ appears to describe how design aware cognition proceeds, but it does not seem to relate to the idea, mentioned in the later passages of part 2, that creating stories is part of the process. Selection is an adequate description for a design process if all elements are given in one way or another, but what if they are created? Often, what initiates design is better described as desire than as necessity.

Describing the beginning of the design process as a problem appears to be a reduction.

The text ends with a passage on the value of storytelling. In this latter passage of the article, the concepts appear to have slightly shifted. They seem to be more in line with typical design processes. Indeed, one could say that designing is a form of storytelling. An experienced designer knows how to tell good stories, no matter what the circumstances are, and whether what is encountered is a given design task or an everyday situation – but what about all the other people who have not yet learned to design? How can they become storytellers? Design research literature suggests that one cannot learn to design – in other words, learn the art of telling stories – through reading instructions. To learn this art, one would rather need to train in telling stories. Reading stories would be a part of this training. The classic cited at the very beginning of this commentary would be a good one to start with to learn appreciating subtlety as an important element of a good story.

To conclude, Lissack's article raises many valuable points. We encounter – more commonly than we normally realize – situations that require decisions, which then substantially alter the very situations we find ourselves in. Lissack's text reminds us that what is required in such situations cannot be reduced to static representations. Recognizing this, I have raised in the above paragraphs a series of questions, which indicate that the concepts and arguments would benefit from more precision.

- 1 Zhuangzi, *The Complete Works of Zhuangzi*, trans. Burton Watson (New York: Columbia University Press, 2013), 19.
- 2 Michael Lissack, "Understanding Is a Design Problem: Cognizing from a Designerly Thinking Perspective. Part 1," *She Ji: The Journal of Design, Economics, and Innovation* 5, no. 3 (2019): 231–46, DOI: <https://doi.org/10.1016/j.sheji.2019.07.002>; Michael Lissack, "Understanding Is a Design Problem: Cognizing from a Designerly Thinking Perspective. Part 2," *She Ji: The Journal of Design, Economics, and Innovation* 5, no. 4 (2019): 327–42, DOI: <https://doi.org/10.1016/j.sheji.2019.11.019>.
- 3 Heinz von Foerster, "On Constructing a Reality," in *Understanding Understanding: Essays on Cybernetics and Cognition* (New York: Springer Verlag, 2003), 211–27. Reprint of the abbreviated version of the lecture held in 1973, first published in *Environmental Design Research*, vol. 2, ed. Wolfgang F. E. Preiser (Abingdon: Routledge, 1973).
- 4 Stafford Beer, *Designing Freedom* (London: John Wiley & Sons, 1974).
- 5 *Ibid.*, 65.
- 6 See Nigel Cross, *Designerly Ways of Knowing* (London: Springer Verlag, 2006).
- 7 See Benny Shanon, *The Representational and the Presentational: An Essay on Cognition and the Study of Mind*, 2nd ed. (Exeter, UK: Imprint Academic, 2008).

- 8 *Ibid.*, 9–10; 463.
- 9 Mark Turner, "The Art of Compression," in *The Artful Mind: Cognitive Science and the Riddle of Human Creativity*, ed. Mark Turner (Oxford: Oxford University Press, 2006) 93–113; Mark Turner, "Compression and Representation," *Language and Literature* 15, no. 1 (2006): 17–27, DOI: <https://doi.org/10.1177/0963947006060550>.
- 10 Amanda J. Zellmer, Timothy F.H. Allen, and K. Kesseboehmer, "The Nature of Ecological Complexity: A Protocol for Building the Narrative," *Ecological Complexity* 3, no. 3 (2006): 171–82, <https://doi.org/10.1016/j.ecocom.2006.06.002>.
- 11 *Ibid.*, 178.
- 12 Lissack, "Understanding Is a Design Problem. Part 1," 242.
- 13 Klaus Krippendorff, "Design Research, an Oxymoron?" in *Design Research Now: Essays and Selected Projects*, ed. Ralf Michel (Basel: Birkhäuser, 2007), 67–79; Claudia Westermann, "A Poetics of Designing," in *Design Cybernetics: Navigating the New*, ed. Thomas Fischer and Christiane M. Herr (Cham: Springer Nature, 2019), 233–45.
- 14 Ben Sweeting, "Wicked Problems in Design and Ethics," in *Systemic Design: Theory, Methods, and Practice*, ed. Peter Jones and Kyoichi Kijima (Tokyo: Springer Japan, 2018), 119–43.
- 15 Lissack, "Understanding Is a Design Problem. Part 2," 331.

Journalism and Biotechnology as Design Problems: A Personal Account

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Abstract This is a short commentary on Michael Lissack's two-part article "Understanding is a Design Problem: Cognizing from a Designerly Thinking Perspective." I reflect on my careers in journalism and biotechnology in the context of Lissack's rubric of cognizing, including his concepts of compression and representation and his use of agency and choice. The relevance of his analysis to everyday acts supports the potential of Lissack's cognizing toolkit in overcoming civic and social discord.

Keywords Design; journalism; biotechnology